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NEW AND RENEWABLE SOURCES OF ENERGY

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FOLLOW-UP OF NAIROBI PROGRAMME OF ACTION

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I. THE NAIROBI PROGRAMME OF ACTION

1. The United Nations Conference on New and Renewable Sources of Energy held at Nairobi from 10 to 21 August 1981 adopted a comprehensive Programme of Action, termed the Nairobi Programme of Action. Based on the comprehensive preparatory activity that had preceded the Conference, it provides a framework for national action as well as of inter-country co-operation to promote transition to energy systems less dependent on hydrocarbons. The Programme pinpoints, quite specifically, the particular place that the various new and renewable sources of energy will have in the energy systems of the future. It also spells out the directions of effort to be made to realize fully the potential of these sources. A summary of the Programme is attached as an annex.

II. FOLLOW-UP ACTION

2. The main outcome of the Conference is the emphasis on vigorous and effective implementation of the measures set out in the Programme. The follow-up phase is visualized as a part of the continuum initiated with the preparations for the Conference undertaken at the national, regional and global levels. It is envisaged that the institutions which have played an active role in the preparatory phase will continue to make effective contributions also in the implementation phase and that, keeping in mind the demands of implementation, those institutions would be appropriately strengthened.

III. NATIONAL FOLLOW-UP

3. It has been recognized that action for the development of new and renewable sources of energy (NRSE) will primarily have to be taken within the countries; the contribution of international co-operation will be of a supportive nature. The action to be taken at the national level, as set out in Section B of the Programme, will consist of a wide range of measures, broadly including the following:

(a) Assessment of NRSE, including surveying and mapping programmes, to provide the necessary information and data base for planning and decision-making with respect to over-all energy development;

(b) Preparation of a policy framework for defining the role of NRSE and determining priorities;

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(c) Establishment or strengthening of appropriate national institutional arrangements;

(d) Adequate research and development programme to support the scientific and technical capacity to develop, choose and adapt technologies, to include testing and demonstration facilities and research focal points in NSRE;

(e) Programmes to encourage the efforts of national public and private entities in interested countries, as appropriate, to expand the development and utilization of NRSE;

(f) Availability of qualified personnel, to include specialized education and training programmes equally accessible to men and women; and

(g) Development or strengthening of industrial capacity to manufacture, adapt, repair and maintain energy-related equipment.

The nature of the measures to be taken under each of the above heads is indicated in the Programme; but the priority ranking between them and the modalities of their implementation are, of course, to be determined by the national authorities in the specific circumstances of each country. A major concern of the Committee on Natural Resources at this session should be to reflect on the mechanisms needed for earnest consideration of these measures, allocation of the requisite resources, establishment/strengthening of the relevant institutional arrangements and their co-ordination. The Committee may make recommendations aimed at ensuring that the momentum created by the Conference is fully maintained and that the implementation effort at the national level is substantial and effective.

4. A considerable part of the national effort will, no doubt, be devoted to the commercialization of mature technologies related to NRSE. However, it has to be recognized that many technologies are still at the stage of research and development, trial on pilot scale etc. Moreover, even mature technologies require considerable adaptive effort to suit the local conditions. The Committee may, therefore, note the emphasis placed in the Programme on strengthening the research and development and the adaptive capabilities of the developing countries and on the deployment of adequate financial and manpower resources for that purpose. In its recommendations to the member Governments the Committee may wish to keep this aspect particularly in view.

5. Another important requisite is to spread awareness among the public in regard to the equipment and processes which are now available on a co[illegible]rcial scale for the utilization of NRSE. The fullest utilization of mass media and of the extension mechanisms is, therefore, called for.

6. The success of programmes for commercialization of mature technologies will, to a great extent, depend on reasonable pricing policies, provision of incentives to consumers and manufacturers of equipment, institution of adequate indigenous production facilities and provision of maintenance services. The programmes to be initiated at the national level should devote due attention to these specific aspects.

IV. REGIONAL FOLLOW-UP

7. A significant feature of the Programme is its recognition of the major role that the subregional and the regional bodies can play in support of the national initiatives. The Programme has, therefore, recommended the strengthening of the regional commissions in their capacity to undertake programmes relevant to NRSE. It is observed that the regional programmes should generally focus on the following:

(a) Support of resource evaluation, research, development and demonstration, training, energy planning and identification of regional or subregional projects for the development of NRSE;

(b) These activities should be developed and carried out through the establishment of specialized institutions and/or the strengthening of the ones existing in the countries of each region, which would co-operate in order to achieve a more effective implementation of their respective regional programmes;

(c) The strengthening and/or establishment of regional information networks which could connect with the international information networks and focus at the regional level on technologies and application and on the centralization and diffusion of information on equipment, its use and its limits;

(d) Organization of joint research and development activities related to promising technologies;

(e) The feasibility and usefulness of organizing regional demonstration and pilot projects and installations designed both to test application and to disseminate information on technologies related to NRSE;

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(f) Development of pre-investment activities designed to provide a basis for the accelerated implementation of technologies for NRSE;

(g) The strengthening and support of regional efforts directed at the transfer and diffusion of technologies;

(h) Undertaking of joint industrial activities for the production of energy related capital goods;

(i) The organization of technical meetings, seminars, conferences, study tours and so on, with a view to facilitating and developing exchanges of information and experience on the utilization of new and renewable sources of energy.

8. It may be mentioned that the role of the regional commissions in promoting NRSE was also emphasized at an informal meeting of the delegations representing the member countries of ESCAP, which was held at Nairobi on 17 August 1981. The meeting called upon ESCAP to assume the role of developing and implementing an appropriate programme for Asia and the Pacific. It further observed that the regional programme should take into account the specific situations and needs of the regional member countries and should, as far as possible, be based on the "network" approach, whereby the relevant national institutions would be involved in concrete activities relating to NRSE. The meeting, therefore, advised the ESCAP secretariat to interact closely with the national authorities and formulate appropriate activities to be included in the regional programme. The draft programme could be discussed at a meeting of selected experts from the regional countries and, in the light of their views, be finalized into a definite regional project.

9. Work has, accordingly, been initiated in the secretariat. The Secretary-General of the Conference has been approached to provide the necessary funds for (a) a mission to the member countries for consultations with the national authorities and institutions concerned and (b) for holding a meeting of experts. The Committee may wish to endorse this request. In case the Secretary-General finds it impossible to allocate the funds, the Committee may call upon UNDP to allocate them.

10. Assuming the availability of the aforesaid funds, it is expected that the regional programme on NRSE will be ready before the end of this year. After that the issue of its implementation will arise. As the Committee is aware, no new exclusive multilateral financial arrangement for the implementation of the Nairobi Programme of Action emerged from the Conference. The question of securing adequate additional funds for the

purpose will, no doubt, engage the attention of the Intergovernmental Committee, recommended by the Conference. The Committee may wish to emphasize that unless adequate additional financial resources are made available, the implementation of the measures set out in the Nairobi Programme of Action, particularly by the intergovernmental bodies such as the regional commissions which are dependent on multilateral funding, would remain in serious doubt. The additional amounts that can be derived from the existing multilateral sources, in size, hardly match the demands of the substantial activities to be mounted for the implementation of the Nairobi Programme.

11. At the same time, the Committee may call upon UNDP, the international and the regional financing institutions and the donor countries to respond to the demands of the regional programme, in as liberal measure as possible, so that pending the arrangement for additional financing of NRSE, the implementation of the Nairobi Programme does not receive any set-back. As was emphasized at the informal meeting of the delegations representing the ESCAP member countries, maintaining the momentum created by the Nairobi Conference is of the utmost significance. This can be ensured by mobilizing all resources that may be available with the various donor institutions and countries and by utilizing them in mounting specific activities.

12. In the formulation of the regional programme care will be taken to involve all relevant regional and subregional institutions and to devolve on them the maximum possible responsibility for policy setting and implementation. Even so, the ESCAP secretariat will be called upon to play a much larger role than heretofore. The Committee may wish to consider how it could be equipped adequately so as to be able to cope with the new demands on it.

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SUMMARY OF THE NAIROBI PROGRAMME OF ACTION

INTRODUCTION

The United Nations Conference on New and Renewable Sources of Energy (Nairobi, 10-21 August 1981) based its work on the premise that supplies of conventional fossil fuels - coal, gas and oil - will not last foreover and that the world will have to develop new, alternative sources of energy to sustain itself.

The Nairobi Programme of Action states that the challenge and the opportunity confronting the international community is to achieve an orderly and peaceful energy transition from the present international economy based primarily on hydrocarbons (petroleum and gas) to one based increasingly on new and renewable sources of energy. The Programme notes that the future demand for energy will increase not only in industrialized countries but also much more dramatically in the developing countries. If the global demand for energy is to be met, it will require a shift away from the current excessive reliance on hydrocarbons towards a more diversified mix of energy sources, as well as a significant and continuing progress in the efficient and rational use of the available resources.

The Programme also states that the development and utilization of new and renewable sources of energy (NRSE) must be viewed in the context of energy transition. Although these sources can make a significant contribution, yet their role and potential in the short term should not be overstated. For the foreseeable future, it notes, hydrocarbon supplies will continue to play a very important role in meeting the global energy demand, although, over time, that role will decline. To facilitate the energy transition, the Programmes recommends that a process should now be set in motion to ensure the most efficient identification, assessment, development and utilization of all energy sources including NRSE.

The Programme states that the primary responsibility for promoting the development and utilization of NRSE rests with individual countries and it outlines the measures the countries should take in that regard. These measures include:

- Assessment of new and renewable sources including surveying and mapping programmes, to provide the necessary information and data base for planning and decision making with respect to over-all energy development;

/- Preparation

- Preparation of a policy framework for defining the role of new and renewable sources of energy and determining priorities;
- Establishment or strengthening of appropriate national institutional arrangements;
- Adequate research and development programmes to support the scientific and technical capacity to develop, choose and adapt technologies, to include testing and demonstration facilities and research focal points in new and renewable sources of energy;
- Programmes to encourage the efforts of national public and private entities in interested countries, as appropriate, to expand the development and utilization of new and renewable sources of energy;
- Availability of qualified personnel, to include specialized education and training programmes equally accessible to men and women; and
- Development or strengthening of industrial capacity to manufacture, adapt, repair and maintain energy-related equipment.

Efforts designed to explore and develop conventional energy resources must be continued, the Programme states, together with efforts designed to explore and develop NRSE. This should be accompanied by efforts aimed at the rational use of energy wherever possible.

Within the above-mentioned broad policy areas, after taking into consideration the results of the preparatory process, the programme recommends the following specific measures at national, subregional, regional and global levels as indications of broader activities in the context of such comprehensive programmes as may subsequently be developed.

I. ASSESSMENT AND PLANNING

(a) Hydropower

(i) Evaluate river hydro potential using stream records and apply existing and develop new methodologies to determine stream flow at ungauged sites;

(ii) Establish criteria for the evaluation and integration of small, lowhead, as well as large scale hydro resources within the context of over-all energy development and multipurpose programmes;

(iii) Support studies on the relation between the use of dams for power generation and for other purposes.

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(b) Fuelwood and charcoal

(i) Assess and evaluate forest resources in order to estimate their present and future sustainable yield of fuelwood, to identify deficit areas in which reafforestation is both urgent and practicable.

(c) Biomass

(i) Assess and evaluate biomass resources with special attention to identification and development of plant species, specifically for energy conversion, taking into account the crucial role that can be played by the recycling of organic matter in sustaining biomass productivity.

(d) Solar energy

(i) Evaluate the solar resource through:

- Use of existing data, supplemented by support of meteorological surveys, radiation and other relevant data collection, using ground-based measuring stations, satellites and reliable photo-interpretation techniques for all climatic conditions;
- Development and application of methodologies to estimate radiation data based, for instance, on space and time correlation functions;
- Preparation of guidelines for the assessment of solar potential in various climatic zones;
- Support for the preparation of solar resources maps and data to be incorporated in the world solar atlas on the global distribution of solar radiation.

(e) Geothermal energy

Identify and evaluate the resources by:

(i) Utilizing all appropriate geological, geochemical and geophysical techniques;

(ii) Utilizing, where available, oil and gas exploration data in the identification and assessment of geothermal energy prospects;

(iii) The preparation and periodic revision of national and regional assessments of geothermal potential.

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(f) Wind energy

Assess the resources by:

(i) Improving and supporting increased collection of wind data at standard heights in forms appropriate for the evaluation of its potential as an energy source, using standardized instrumentation, methods and analysis for all climatic conditions;

(ii) Support for the preparation of national wind power resource maps and data to be incorporated in a world wind atlas, including data on the occurrence of extreme wind speeds.

(g) Oil shale and tar sands

Initiate and intensify resource assessment by:

(i) Reviewing and indexing possible occurrences, using the existing literature on geological and mineral exploration;

(ii) Standardizing evaluation and measurement procedures.

(h) Ocean energy

(i) Assess the ocean energy resource by identifying sites of potential Ocean Thermal Energy Conversion (OTEC), tidal and wave energy utilizing archival data and other existing information as well as by undertaking OTEC, tidal and wave energy surveys through the joint efforts of oceanographic and meteorological organizations.

(i) Draught animal power

Resource assessment and planning through:

(i) Collection of basic data on distribution of species, breeds, draught capabilities, the affect of energy on crop yields, agricultural implements, harnessing devices and existing draught animal power technologies;

(ii) Consideration of animal power as a basic energy input in agriculture planning.

(j) Peat

(i) Initiate and/or expand the data base on the availability of peat to evaluate its potential;

(ii) Support the selection of suitable peat production areas, taking into consideration economic, employment and other social and environmental factors as well as the location of potential consumers.

II. RESEARCH, DEVELOPMENT AND DEMONSTRATION

(a) Hydropower

(i) Establish and/or strengthen research, development and demonstration capacities of national governments for assessing, selecting and adapting relevant hydropower technologies;

(ii) Intensify research on ecological consequences caused by hydro development.

(b) Fuelwood and charcoal

(i) Intensify and/or establish basic and applied research on more productive species;

(ii) Support and promote work aimed at improving the efficiency of stoves and cooking utensils, develop low-cost stoves and promote their widespread use, taking into account social and cultural acceptability;

(iii) Improve preprocessing of fuels, including those presently wasted such as twigs, branches and dry leaves, for use in direct combustion and other processes and improve the conversion efficiency of charcoal making;

(iv) Develop promising fuelwood and charcoal substitutes or supplements utilizing other new and renewable sources of energy.

(c) Biomass

(i) Initiate and/or intensify basic and applied research and development on specific aspects of biotechnology and bio/thermochemical conversion systems and on the use of by products as fertilizers and animal feed;

(ii) Accelerate the utilization of biomass resources for energy production through initiation and/or support for demonstration schemes such as biomethanation of manures, agricultural residues and other organic materials in different regions of the world; integration of biomethanation and ethanol production; small-scale gasifiers and stationary engines; electricity production, using gasifiers and engine generators and including short-rotation forestry in energy farms; gasification and indirect liquefaction to produce synthetic liquid fuels from lignocellulosic materials.

(d) Solar energy

(i) Initiate, intensify and support research, development and demonstration in promising applications, especially those which are small and decentralized, in order to reach a level of development sufficient for

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commercial utilization such as: solar cooking, solar electricity production (thermal and photovoltaic), solar air conditioning and refrigeration, solar industrial process heat, synthetic fuel production and solar crop drying. Among the main areas for research and development are material and thermal sciences, photochemical conversion, durability and reliability of products, design and adaptation of processes, system analysis and control, storage systems, and social acceptability.

(e) Geothermal energy

Undertake research and development in:

(i) Drilling technology;

(ii) High, medium and low enthalpy geothermal systems;

(iii) Multi-purpose developments;

(iv) Stimulation techniques;

(v) Geopressurized systems;

(vi) Hot dry rock systems;

(vii) Rock properties under high temperatures, and heat transfer in solid and fractured media;

(viii) Chemical recovery and effluent disposal;

(ix) Material selection and scaling control;

(x) Binary and other alternative generation systems;

(xi) Problems of subsidence, gaseous emissions and other environmental impacts.

(f) Wind energy

(i) Initiate and support research, development and demonstration in such promising technologies as: wind machines rated at 0.1-100 kW, especially for rural applications where a variable output is acceptable, in particular for water pumps and wind turbines coupled with conventional power supplies or storage systems so as to yield reliable stand-alone systems (in the range 10-1000 kW); larger wind turbines and arrays suitable for integration in networks in order to conserve conventional fuels or hydro.

(ii) Support research and development on wind characteristics for siting, design and operation of windmills, rotor design, materials, storage systems, wind turbine - storage system; matching environmental impact, safety standards and social acceptability.

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(g) Oil shale and tar sands

Undertake research and development on:

(i) Adapting capacity of shale retorting with particular reference to the end uses;

(ii) The environmental consequences on land and water resources of production and waste disposal;

(iii) Extraction and recovery methods.

(h) Ocean energy

(i) Initiate or continue research and development in such areas as:

- Aquaculture based on nutrient-rich deep waters; floating, land-based and shelf-based ocean systems directed to the production of electricity; fresh water and energy intensive products;
- Ocean wave systems, including technical solutions suited for the trade-wind belts.

(ii) Accelerate the application of ocean energy systems when this appears justified, for example by:

- An extension of existing facilities, where feasible, for use as regional/international demonstration sites;
- Efforts directed at isolated communities.

(i) Draught animal power

Research and development activities in the following areas:

(i) The design, development, testing and evaluation of agricultural implements, animal-drawn vehicles, harnesses and hitching devices so as to enhance the productivity of draught animals;

(ii) Appropriate breeding schemes, draught animal feeding and management, fodder and improvement of pastures.

(j) Peat

(i) Develop and improve technologies for peat production, particularly in tropical and sub-tropical vegetational zones, as well as combustion and processing, including gasification and liquefaction processes.

(ii) Conduct studies on alternative uses of peat.

(iii) Promote research in the utilization of cutaway peatlands for production of fuelwood and timber for industry, agricultural use, etc.

(k) Priority areas identified in the Programme of Action

(1) Rural of energy

(i) Identification of fast growing species for fuelwood production, reforestation and afforestation, especially in areas short of fuelwood.

(ii) Development of more efficient low-cost stoves and charcoal production processes.

(iii) Development of promising new and renewable sources of energy technologies suitable for replication and widespread use that are able to compete technically and economically with conventional alternatives, in a given region, and are ecologically sound and socially acceptable, especially for such purposes as cooking, crop drying, pumping and agro-industries.

(iv) Improvement of equipment used in conjunction with draught animals.

(v) Evaluate existing and develop new bio-technological processes based on manure and other organic materials for the production of mechanical and electrical power, heat and light, as well as small-scale gasifiers based on thermo-chemical processes to fuel engines.

(vi) Develop new or improved technologies based on new and renewable sources of energy for harvesting, preserving and processing food and for using agricultural and forest residues for energy purposes. Such development should involve the major end-users.

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(2) Urban and industrial energy

(i) Intensification of research in solar technologies for domestic and industrial use, especially in the areas of heat and power generation, solar passive architecture, solar refrigeration, air conditioning and water desalination.

(ii) Intensify research for the production of fuels from biomass and the processing and use of urban and agro-industrial wastes for energy and other purposes.

(iii) Undertake research and development in the areas of multi-purpose development of hydro and geothermal energy, including drilling technologies.

(iv) Intensify research, development and demonstration in increased energy efficiency and conservation as well as in the area of energy storage systems.

III. TRANSFER, ADAPTATION AND APPLICATION OF MATURE TECHNOLOGIES

(a) Hydropower

(i) Standardize design and performance specifications for hydro equipment and facilities as far as possible and make optimum use of package designs for small-scale plants suitable for replication and widespread use, consistent with national needs and practices.

(ii) Adopt measures designed to accelerate the widespread utilization of small-scale (including micro) hydropower systems.

(iii) Conduct pre-investment studies related to enhancing the industrial capabilities of developing countries to design, adapt and manufacture hydropower equipment with a view to identifying the most promising projects.

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(iv) Support design, production and/or adaptation of hydro equipment and civil engineering survey and design procedures, especially in developing countries.

(v) Support the collaborative efforts of interested developing countries in large-scale joint projects, which could include the interconnection of electrical networks.

(b) Fuelwood and charcoal

(i) Improve and/or establish forest management practices.

(ii) Increase and/or establish reforestation and afforestation programmes with selected and tested species.

(iii) Promote and support programmes, projects and activities to establish large-scale plantations including afforestation in deficit areas and wood lots, establish distribution, control and pricing policies, and improve conversion and utilization technologies (charcoal production and gasification, kilns, ovens).

(c) Biomass

(i) Accelerate the utilization of biomass resources for energy production through initiation and/or support for the utilization of mature technologies such as: direct combustion, gasification, biomethanation of manure and municipal and industrial waste, including collection and handling, alcohol production from sugars and starches, anaerobic microbiological processes and the production of fuels from vegetable oils, giving due consideration to possible implications for food and fertilizer production and other environmental and economic considerations.

(d) Solar energy

(i) Initiate and/or support national programmes for the widespread use of mature solar energy technologies.

(ii) Study the problems associated with the widespread use of solar energy such as those relating to right of access to sunlight, transfer of development rights, building codes and varranties. Insurance of solar devices should be explored.

(e) Geothermal energy

Promote geothermal applications by:

(i) Supporting the initial stages of exploration for promising sites;

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(ii) Encouraging the location of appropriate activities near the source;

(iii) Encouraging integrated heat and power projects;

(iv) Encouraging appropriate small-scale uses, especially for small or remote resource sites.

(f) Wind energy

(i) Promote national programmes for the widespread use of mature wind energy technologies.

(g) Oil shale and tar sands

(i) Initiate and/or support national programmes for widespread use of mature oil shale and tar sands energy technologies.

(h) Draught animal power

(i) In order to ensure more efficient application, where appropriate, measures should be taken to support ongoing draught animal programmes in developing countries.

(i) Peat

(i) Promote measures to encourage the industrial use of peat and its use domestically, particularly as a replacement for fuelwood and charcoal in the sod, briquette and pellet forms.

(j) Priority areas identified in the Programme of Action

(i) General programmes

(i) Designation strengthening and/or establishment of national, subregional or regional centres to serve as focal points for transferring and adapting new and renewable sources of energy technologies. These focal points could be based on a source and/or end use specific approach as appropriate. Field testing, demonstration and evaluation of complete systems, in the context in which they are to be used and in accordance with local energy characteristics are included within the transfer and adaptation functions of these centres. Such centres should work in co-operation with local industry and also serve for information, education and training purposes, and could later be integrated into sub-regional, regional and international networks.

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(ii) Establishment and development at the national, subregional and regional levels of the capacity for the manufacture, operation, maintenance, marketing and management of equipment and spare parts related to the use of new and renewable sources of energy.

(2) Rural energy

Of particular concern to developing countries is the need for taking urgent measures aimed at alleviating the acute domestic energy supply problem, particularly the fuelwood crisis, which is assuming alarming dimensions. On goal of the Nairobi Programme of Action is that during the present decade countries will undertake planned programmes with a view to ensuring that the energy needs of the rural areas can be met on a sustainable basis. To that end the following priority actions for transferring, adapting and applying mature technologies in rural areas have been identified:

(i) Widespread application of improved practices and technologies for the conservation and more effective use of natural forestry resources;

(ii) Establishment and acceleration of programmes for large scale reforestation and afforestation with selected and tested species, as well as for smaller scale wood lots and plantations of energy crops, particularly in arid, semi-arid and deficit regions, as part of an effort to increase five-fold the annual rate of fuelwood planting and to meet effectively and sustainably the demand for biomass fuels by the year 2000;

(iii) Generalized rural application of locally available new and renewable sources of energy, in particular integrated systems where feasible, using mature of proven technologies;

(iv) Adoption of programmes to expand the application of improved techniques for utilizing draught animal power, including improved husbandry practices.

(3) Urban and industrial energy

In order to help meet the growing industrial and urban energy demand in many countries, in particular that brought about by development and industrialization efforts of developing countries, and to diversify the energy supply base, efforts are needed to increase significantly the contribution of new and renewable sources of energy to urban and industrial energy requirements. To that end the following priority areas have been identified:

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(i) Expand, where appropriate, the utilization of small and large scale hydro resources, geothermal resources and associated transmission systems;

(ii) Initiate and encourage the wider application of active and passive solar heating and cooling systems for domestic, commercial and industrial purposes;

(iii) Initiate and implement programmes to promote the use of urban and industrial wastes for energy and other purposes;

(iv) Initiate and implement programmes to accelerate the incorporation of cogeneration and total energy systems in the industrial sectors and other such energy efficiency and conservation programmes.

IV. INSTITUTIONAL ARRANGEMENTS

Under this section the programme contains recommendations pertaining to an intergovernmental body, co-ordination mechanisms, task forces for implementing specific programmes and projects of the Programme of Action, secretariat support, regional and subregional action and economic and technical co-operation among developing countries and intergovernmental and non-governmental organizations.

The Programme states that there should be an intergovernmental body in the United Nations specifically concerned with new and renewable sources and entrusted with guiding and monitoring the implementation of the Nairobi Programme of Action. This body should be open to the participation of all States as full members and should submit its reports and recommendations to the General Assembly through the Economic and Social Council, which might transmit to the Assembly such comments on the report as it might deem necessary, particularly with regard to co-ordination. The recommendation of the Assembly on the report of the Committee would be transmitted for follow-up to the organs, organizations and bodies of the United Nations system, as well as Governments and the international community.

The intergovernmental body would undertake a number of functions, including:

- To recommend policy guidelines for different organs, organizations and bodies within the United Nations system in regard to new and renewable sources of energy, on the basis of the Nairobi Programme of Action;

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- To formulate and recommend action-oriented plans and programmes for carrying out the Nairobi Programme of Action in accordance with the priorities identified in it;

- To keep under review and modify as may be necessary the priorities established in the Programme of Action;

- To review and assess trends and policy measures related to the development and utilization of new and renewable sources of energy, with a view to increasing their contributions to meeting future over-all energy requirements;

- To promote the mobilization of the resources required in the implementation of the Nairobi Programme of Action;

- To recommend guidelines to the financial organs, organizations and bodies of the United Nations system in the financing of the activities related to the implementation of the measures of the Nairobi Programme of Action, and to help ensure the implementation of the measures listed in this chapter of the Programme of Action; relating to financial resources;

- To monitor the implementation and help ensure co-ordination of the measures established in the Nairobi Programme of Action as well as of the activities of the organs, organizations and bodies of the United Nations system in the field of new and renewable sources of energy;

- Be informed of, draw upon and contribute to the work and expertise of governmental and other intergovernmental institutions in the field of new and renewable sources of energy; and

- To review the activities of the United Nations system in the field of new and renewable sources of energy and implementation of the Nairobi Programme of Action, and where necessary make recommendations on the adaptation of the Nairobi Programme of Action.

The Programme stresses the need for continuity between the preparatory process for the United Nations Conference on New and Renewable Sources of Energy and the Launching of the Nairobi Programme of Action. Accordingly, and without prejudice to final institutional arrangements, it recommends that the immediate launching of the implementation of the Programme be entrusted to a committee patterned on the Preparatory Committee for the United Nations Conference on New and Renewable Sources of Energy. The Committee would hold one session only, in 1982, which would last not more than two weeks. On that occasion, the Committee would be entrusted with the functions and responsibilities listed above. It would report to the

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thirty-seventh session of the General Assembly in 1982 through the Economic and Social Council, which would transmit to the Assembly comments on the report as necessary. The final decision on further institutional measures would be taken by the General Assembly in 1982.

The Programme of Action emphasizes that in order to ensure its successful implementation, the United Nations system should fully participate in and support the implementation of the Programme, and should increase its responsiveness in this respect as well as to provide for co-ordination within itself.

In this connexion, the Programme recommends that the United Nations Director-General for Development and International Economic Co-operation, acting under the authority of the Secretary-General as Chairman of the Administrative Committee on Co-ordination, be entrusted with the task of co-ordinating the contributions of the organs of the United Nations system within the framework of his mandate. A co-ordinating capacity on new and renewable sources of energy in the office of the Director-General would be provided for, making full and efficient use of the resources already existing within the United Nations.

Task forces: In cases where other machinery within the United Nations system cannot effectively undertake a specific task or programme, the intergovernmental body might recommend the establishment of ad hoc task forces tailored to the requirements of specific time-limited tasks related to NRSE, from among existing United Nations organs.

Secretariat support: The Secretary-General has been requested to make recommendations to the thirty-sixth session of the General Assembly later this year on the most effective and efficient arrangements for carrying out the substantive services required, including the possibility of a small separate secretariat unit for NRSE; making full and efficient use of the resources available in the United Nations subject to the normal procedure of the General Assembly.

Regional and subregional action: One of the tasks of international co-operation with respect to the development of NRSE includes support for regional and subregional efforts for implementing the Programme. In this context, the document states, whenever appropriate and necessary, the strengthening of regional commissions and regional development banks, support for regional programmes relevant to new and renewable sources of energy, and the establishment of intergovernmental bodies should be undertaken in order to facilitate implementation of the Programme of Action.

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Priority attention should be given to the following:

(a) Support of resource evaluation, research, development and demonstration, training, energy planning and identification of regional or subregional projects for the development of new and renewable sources of energy;

(b) These activities should be developed and carried out through the establishment of specialized institutions and/or the strengthening of the ones existing in the countries of each region, which would co-operate in order to achieve a more effective implementation of their respective regional programmes;

(c) The strengthening and/or establishment of regional information networks which could connect with the international information networks and focus at the regional level on technologies and application and on the centralization and diffusion of information on equipment, its use and its limits;

(d) Organization of joint research and development activities related to promising technologies;

(e) The feasibility and usefulness of organizing regional demonstration and pilot projects and installations designed both to test application and to disseminate information on technologies related to new and renewable sources of energy;

(f) Development of pre-investment activities designed to provide a basis for the accelerated implementation of technologies for new and renewable sources of energy utilization;

(g) The strengthening and support of regional efforts directed at the transfer and diffusion of technologies;

(h) Undertaking of joint industrial activities for the production of energy related capital goods; and

(i) The organization of technical meetings, seminars, conferences, study tours and so on, with a view to facilitating and developing exchanges of information and experience on the utilization of new and renewable sources of energy.

Economic and Technical Co-operation among Developing Countries:
The Programme states that developing countries should seek to enhance their collective self-reliance in various areas through programmes of economic and technical co-operation. In this context, the international community

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should take measures to provide support and assistance to the efforts of developing countries to accelerate co-operation among themselves in the field of new and renewable sources of energy.

Intergovernmental and non-governmental organizations: The Programme states that intergovernmental and non-governmental organizations can make a useful contribution to the successful implementation of the Programme, and requests them to review their activities to determine how they can best support and contribute to the implementation of the Programme.

V. MOBILIZATION OF FINANCIAL RESOURCES

The Programme states that its implementation requires the mobilization of additional and adequate resources. Each country will continue to bear the main responsibility for the development of its new and renewable sources of energy which would require vigorous measures for a fuller mobilization of its domestic, financial and other resources.

Implementation of the Programme requires additional and adequate international financial resources, both public and private, from all countries, international financial institutions and other international organizations. Such financial resources would be used to support national efforts of developing countries aimed at the development of NRSE within the context of the Nairobi Programme.

For the purpose of undertaking the various activities of the Programme, it is stated that the financial mechanisms and institutions of the United Nations system should be provided with additional and adequate funds to meet the requirements for preliminary supporting actions and pre-investment activities relating to the development of new and renewable sources of energy in developing countries.

In this context, the Programme states, it is necessary to improve existing mechanisms and institutions with a view to enhancing their effectiveness and efficiency. Specific and additional resources should be directed through such channels as the United Nations Development Programme (UNDP), the Revolving Fund for the Exploration of Natural Resources, the interim financial arrangements for science and technology, the UNDP Energy Account and others directly or indirectly involved. Within over-all efforts to ensure official development assistance (ODA) growth, the Programme states that all developed countries should emphasize the development and utilization of new and renewable sources of energy as one of the priority areas in their international co-operation and development assistance.

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In order to secure access to the widest possible range of financial resources, the Programme urged that international and regional development financial institutions, in particular the World Bank, provide additional and adequate resources specifically for large-scale supporting activities, pre-investment and investment activities in the field of new and renewable sources of energy. These financial mechanisms and institutions are urged to respond more widely to national requests as well as those of subregional, regional and international organizations engaged in the development of new and renewable sources of energy in developing countries.

Financial requirements for over-all energy investment will continue to grow at a fast pace during the coming years, the Programme states. While developing countries will continue to bear the main responsibility for their development, external financial resources, private and public, particularly concessional flows and official development assistance (ODA), will constitute an indispensable element of support for the developing countries' own efforts.

The World Bank and UNDP should be invited to undertake a joint study for making as accurate an estimate as possible for the supporting actions and pre-investment requirements for new and renewable sources of energy in the developing countries in the 1980s to be completed as soon as possible and if practical by the end of this year.

The Programme recommends that, at the global, regional and subregional levels, multilateral and bilateral donors and interested recipient countries should consider convening consultative meetings to review and facilitate concerted action in this field. These meetings should address the priority areas identified by the Nairobi Programme, and deal particularly with financing the promotion of research, demonstration and development activities in new and renewable sources of energy.

In addition, the Programme urges all interested parties to accelerate consideration of other possible avenues that would increase energy financing, including those mechanisms being examined in the World Bank (such as an energy affiliate).

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